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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes.	Rulemaking 20-05-003 *(Filed May 7, 2020)*

OPENING COMMENTS OF FERVO ENERGY COMPANY TO THE ADMINISTRATIVE LAW JUDGE'S RULING SEEKING FEEDBACK ON MID-TERM RELIABILITY ANALYSIS AND PROPOSED PROCUREMENT REQUIREMENTS

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I. INTRODUCTION

Fervo Energy Company ("Fervo") is pleased to submit these opening comments on the Administrative Law Judge's Ruling issued on February 22, 2021 seeking feedback on mid-term reliability analysis and proposed procurement requirements. Fervo commends the California Public Utilities Commission ("Commission") for the analysis conducted to date and expresses support for the proposed procurement requirement of at least 1,000 MW of geothermal energy by 2025.

Fervo commercializes technology to develop, own, and operate geothermal assets as the dispatchable foundation to a 100% clean energy future. Fervo's approach incorporates proven, cost-effective technology such as horizontal drilling and advanced fiber optic measurements to unlock the potential of geothermal energy in the U.S. and abroad.

Geothermal is unique among renewable energy resources: it provides power 24/7, exists at scale today, and has virtually limitless potential. Despite these unique attributes, geothermal's role in a rapidly changing energy landscape has been consistently deemphasized. Today, the geothermal

industry is primed for a breakthrough: availability of resource is immense, costs have fallen precipitously, and the regulatory environment has leveled the playing field with other renewable technologies. The geothermal procurement target proposed by the Commission would trigger large-scale deployment of shovel-ready projects and further reinforce California's standing as America's clean energy leader.

II. COMMENTS

a. General Comments: Geothermal Industry Momentum

The following list identifies significant contributors to recent industry momentum encouraging increased geothermal penetration. By calling out these contributors, Fervo intends to assure the Commission that the geothermal industry can and will field at least 1,000 MW of new capacity by 2025 with the help of the mandate proposed in the Ruling.

- **The cost of geothermal is falling.** Despite enormous efficiency gains achieved by the oil and gas industry over the last decade, little technology transfer has occurred between oil and gas and geothermal industries. According to the U.S. Energy Information Agency ("EIA"), since 2011, the oil and gas industry has experienced a ten-fold increase in drilling productivity, that, if applied to geothermal wells, could reduce costs meaningfully.[1] This technology transfer could extend beyond drilling to sub-surface characterization and operational execution, driving efficiency gains throughout the geothermal exploration and development life cycle.

- **Recent game-changing policy developments have put geothermal on a level playing field with other renewables.** Provisions in the Energy Act of 2020 signed into law as part of the Consolidated Appropriations Act, 2021 combined with positions taken by the Biden Administration have massively increased support for geothermal.[2] Previously left out of tax incentives granted to the solar and wind industries, geothermal was included in the 2020 Production Tax Credit extension. Additionally, the Geothermal Technologies

[1] EIA Drilling Productivity Report < https://www.eia.gov/petroleum/drilling/pdf/dpr-full.pdf>.
[2] Pub. L. 116-260.

Office budget authorization increased 102%, and numerous technology deployment initiatives were authorized.[3]

- **There is a renewed interest in long-term geothermal offtake agreements to help entities meet carbon-free energy targets.** In 2020, nine new long-term geothermal power purchase agreements were executed, exceeding the number of commercial contracts from the five previous years combined, at an average price of $67.7/MWh.[4]
- **Widespread decarbonization legislation has solidified the need for 24/7, zero-carbon energy.** In the second half of 2020, states with 100% clean electricity standards increased in number from six to nine. Across those states, buyers recognized that readily available, intermittent sources of clean electricity will not be able to fully service expected loads, leading to new fossil fuel buildouts unless reliable clean alternatives can be procured.[5]
- **Geothermal is attracting unprecedented levels of private investment.** Already in 2021, private entities have invested nearly $200 million in new companies executing innovative approaches to geothermal energy development.

b. Specific Comments

Question 10: The process of identifying resource types and amounts that are cost-effective, and can potentially fulfill a procurement need, but have market or other barriers to procurement, is explored in Section 6.5.4 of the Procurement Framework Staff Proposal. Comment on the approach described in this ruling, with reference to the Staff Proposal and/or other approaches you would recommend.

Fervo believes that Option 1 of 6.5.4 of the Procurement Framework Staff Proposal, taking an attribute-oriented approach with targeted sensitivity analysis, is the right approach and would sufficiently highlight the value of geothermal energy. One caveat: since the geothermal industry

[3] Consolidate Appropriations Act, 2021 < https://rules.house.gov/sites/democrats.rules.house.gov/files/BILLS-116HR133SA-RCP-116-68.pdf>.
[4] Initial Results from the 2020 U.S. Geothermal Power Production and District Heating Market Report < https://www.nrel.gov/docs/fy21osti/77774.pdf>.
[5] State Renewable Portfolio Standards and Goals < https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.

has evolved rapidly over the last twelve to eighteen months, it would be essential for this need determination approach to incorporate truly up-to-date information on the geothermal energy industry. Outdated information could misconstrue the industry's potential and undervalue the resource. Fervo would willingly participate in additional data gathering to confirm costs and other key assumptions.

Question 11: Comment on whether the suggested amount of geothermal and/or long-duration storage resources should be required to be procured as part of the mid-term procurement requirements.

The proposed amount of geothermal energy should absolutely be required to be procured as part of the mid-term procurement requirements. The prior IRP proceeding considered the possibility of 1,700 MW of new geothermal generation by 2030 to meet the state's climate and reliability goals.[6] However, no concrete action has been taken to realize this goal. As a result, very little geothermal development has occurred in the state. Geothermal has a vital role to play in helping California achieve its greenhouse gas reduction targets. Unless there is a significant procurement mandate in place, emphasizing the value of reliable renewable energy, load-serving entities will continue to make decisions based on energy-only pricing assumptions, further exposing the California grid to failure and encouraging the ongoing reliance and even development of fossil-fuel backups.

III. CONCLUSION

With roughly 1,800 MW of installed capacity that accounts for about 6% of the state's utility-scale electricity generation, California is home to more geothermal energy than almost any other *country* in the world. That said, current installed capacity still sits at only a fraction of total resource potential. A 2008 U.S. Geological Survey report identified *at least* 37,000 MW of geothermal electric power generation potential in California—*twenty times* current installed

[6] *See* D.19-04-040 (April 25, 2019).

capacity—and double that in neighboring Nevada.[7] Companies are undoubtedly gearing up in Nevada, where the Bureau of Land Management has leased roughly 250,000 acres for geothermal development over the last three years.[8]

The geothermal resource potential exists, both in California and across state lines. New innovation and technology transfer are driving unprecedented cost reductions across the industry. The policy landscape is changing in favor of 24/7 renewable energy. Private investment is flocking to a variety of companies across the geothermal energy value chain. **The 1,000 MW procurement mandate proposed in the Ruling would truly act as a decisive catalyst for new, shovel-ready geothermal energy development in California and beyond.**

Fervo Energy supports the proposed procurement requirements and urges the Commission to move forward with this pursuit as an effective means of increasing grid reliability and further solidifying California's position as the country's clean energy leader.

Thank you for your consideration of these comments. We would be happy to discuss further at any point.

Respectfully submitted,

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Dated: March 26, 2021

[7] Assessment of Moderate- and High-Temperature Geothermal Resources of the United States < https://pubs.usgs.gov/fs/2008/3082/pdf/fs2008-3082.pdf>.
[8] U.S. Department of the Interior Bureau of Land Management Nevada Geothermal Energy < https://www.blm.gov/programs/energy-and-minerals/renewable-energy/geothermal-energy/regional-information/nevada>.